

**CERTIFICATION DESIGN LETTER
FOR AREA 9, PHASE III
ABANDONED OUTFALL LINE – PART THREE**

**FERNALD CLOSURE PROJECT
FERNALD, OHIO**



MARCH 2005

U.S. DEPARTMENT OF ENERGY

**21140-RP-0004
REVISION 0
FINAL**

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LIST OF ACRONYMS AND ABBREVIATIONS

A1PII	Area 1, Phase II
A9PIII	Area 9, Phase III
ASCOC	area-specific constituent of concern
ASL	analytical support level
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CRDL	contract required detection limit
CU	certification unit
DOE	U.S. Department of Energy
FCP	Fernald Closure Project
FMPC	Feed Material Production Center
FRL	final remediation level
MDL	minimum detection level
mg/kg	milligrams per kilogram
MH	manhole
NPDES	National Pollutant Discharge Elimination System
OSDF	On-Site Disposal Facility
OU5	Operable Unit 5
pCi/g	picoCuries per gram
ppm	parts per million
PSP	Project Specific Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SR	State Route
UCL	Upper Confidence Limit
VSL	validation support level

EXECUTIVE SUMMARY

This Certification Design Letter (CDL) describes the certification approach for a section of Area 9, Phase III (A9PIII) – Part Three from the State Route (SR) 128 to approximately 38 feet west of the Great Miami River. The following information is included in the CDL:

- The boundaries (Figure 1-1) and a description of the area to be certified under the guidance of this CDL;
- A presentation of historical data from the area proposed for certification;
- A discussion of the area-specific constituent of concern (ASCOC) selection process and list of ASCOCs assigned to A9PIII;
- A presentation of the certification unit (CU) boundaries and proposed sampling strategy;
- The analytical requirements and the statistical methodology that will be employed; and
- The proposed schedule for the certification activities.

This CDL covers the soil beneath the abandoned outfall line bedding material from SR 128 to approximately 38 feet west of the Great Miami River and the Manhole (MH) 181-2 above-final remediation level excavation. The soil beneath the abandoned outfall line bedding material located within the Mid Valley Pipeline easement is also covered under the scope of this CDL. However, because the easement is bound on the east and the west by CU 1, which is part of A9PIII – Part One, samples will be collected as part of CU 1 for certification purposes. For the abandoned outfall line trench, precertification real-time measurements will be completed in conjunction with certification sampling. Real-time precertification measurements will be taken following excavation of the impacted area near MH 181A, but prior to certification sampling. Real-time scanning results from precertification activities of A9PIII will be presented in the certification report. The protective sleeve surrounding the abandoned outfall line under SR 128 will be evaluated against the free release criteria per applicable site procedures.

The certification design presented in this CDL follows the general approach outlined in Section 3.4 of the Sitewide Excavation Plan (SEP, DOE 1998) and SEP Addendum (DOE 2001). The selection of A9PIII ASCOCs was accomplished using constituent of concern lists in the Operable Unit 5 Record of Decision (DOE 1996). Three CUs have been established to cover the A9PIII – Part Three certification area. The CU design for CUs 7 and 8 were based on the length and width of the trench. The CU design for CU 9 was based on size of the impacted area in the proximity of MH 181A.

1.0 INTRODUCTION

This Certification Design Letter (CDL) describes the certification approach for demonstrating that soil in Area 9, Phase III (A9PIII) meets the final remediation levels (FRLs) for all area-specific constituents of concern (ASCOCs). The format of this CDL follows guidelines presented in the Sitewide Excavation Plan (SEP, DOE 1998). Accordingly, this CDL consists of five sections:

- 1.0 Introduction - Presentation of the purpose, objectives, and scope of this CDL
- 2.0 Historical Data - Presentation and discussion of historical soil data from A9PIII
- 3.0 Area-Specific Constituents of Concern - Discussion of selection criteria and ASCOCs for A9PIII
- 4.0 Certification Approach - Presentation of design, sampling and analytical methodologies
- 5.0 Schedule

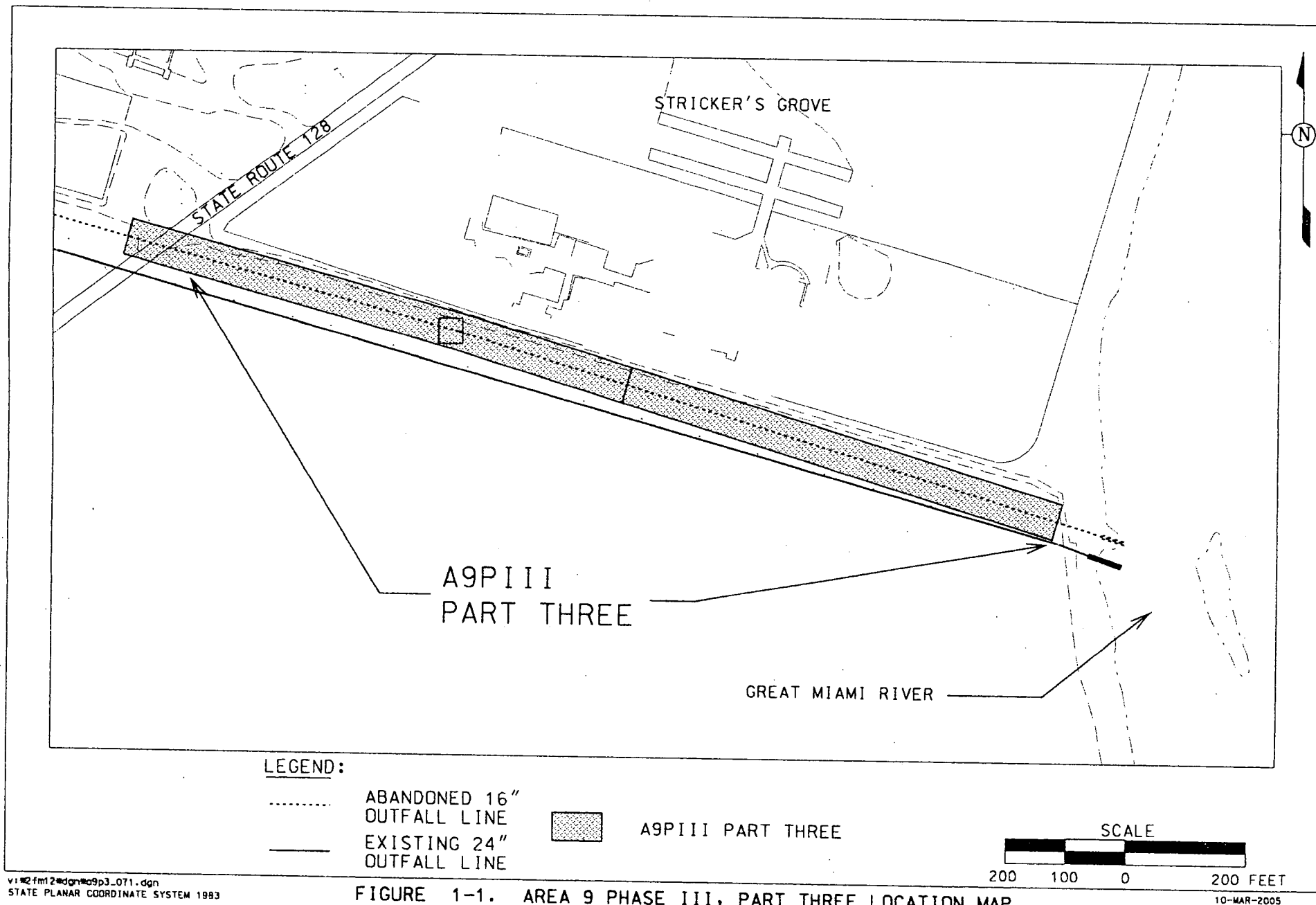
1.1 OBJECTIVES

The primary objectives of this document are to:

- Define the boundaries of the area to be certified under the guidance of this CDL;
- Present historical data collected from within the area proposed for certification;
- Define the ASCOC selection process and list the selected A9PIII ASCOCs;
- Present the certification unit (CU) boundaries and proposed certification sampling strategy;
- Summarize the analytical requirements and the statistical methodology that will be employed; and
- Present the proposed schedule for the certification activities.

1.2 SCOPE AND AREA DESCRIPTION

A9PIII is located off site, stretching east from the eastern boundary of the Fernald Closure Project (FCP) to the Great Miami River. The scope of this CDL covers the portion of A9PIII that extends from the western side of State Route (SR) 128 to approximately 38 feet west of the Great Miami River and the impacted area in the proximity of Manhole (MH) 181A. The location of A9PIII – Part Three is shown on Figure 1-1.



2.0 HISTORICAL AND PRECERTIFICATION DATA

Characterization data have been collected from A9PIII as part of the Offsite Soils Removal Action Around MH 180, Feed Material Production Center (FMPC) Effluent Line (EPA 1988). The criteria identified for this removal action was 52 parts per million (ppm) total uranium and/or 46 ppm total thorium. These action levels were established and used prior to the development of the current FRLs. When the historical data collected in 1989 and 1993 were compared to the newly established FRLs, several FRL exceedances were identified. Confirmatory sampling was conducted to demonstrate whether or not the historical FRL exceedances still exist. Confirmatory sampling verified a historical FRL exceedance at MH 181-4. This exceedance was bound both laterally and vertically and the material will be excavated and sent to the On-Site Disposal Facility (OSDF). The following section further summarizes the data collection chronology.

2.1 HISTORICAL AND PRECERTIFICATION DATA SUMMARY

2.1.1 Historical Physical Sampling Data

Before initiating the certification process, all pertinent historical data relative to A9PIII were examined. This included the August 1988 National Pollutant Discharge Elimination System (NPDES) Permit Application and Offsite Soils Removal Action Around Manhole 180, FMPC Effluent Line. The list of secondary ASCOCs was partially developed from these two sources of information as discussed in Section 3.2. All historical physical sampling data will be presented in Appendix B of the A9PIII Abandoned Outfall Line Excavation Plan, Part Three (DOE 2005a).

2.1.2 Precertification Real-Time Scanning

Precertification real-time scanning will occur in conjunction with excavation of the abandoned outfall line. After the overburden material, piping, and bedding material are removed, real-time scanning of the bottom of the excavation will occur. Precertification results will be presented in the certification report for this area.

3.0 AREA-SPECIFIC CONSTITUENTS OF CONCERN

In the Operable Unit 5 (OU5) Record of Decision (ROD, DOE 1996), there are 80 soil constituents of concern (COCs) with established FRLs. These COCs were retained for further investigation based on a screening process that considered the presence of the constituent in site soil and the potential risk to a receptor exposed to soil containing this contaminant. In spite of the conservative nature of this COC retention process, many of the COCs with established FRLs have a limited distribution in site soil or the presence of the COC is based on high contract required detection limits (CRDLs). When FRLs were established for these COCs in the OU5 ROD, the FRLs were initially screened against site data presented on spatial maps to establish a picture of potential remediation areas.

By reviewing existing Remedial Investigation/Feasibility Study (RI/FS) data presented on spatial distribution maps, the sitewide list of soil COCs in the OU5 ROD was reduced from 80 to 30. This reduction was possible because the majority of the COCs with FRLs listed in the OU5 ROD have no detections above their corresponding FRL, thus eliminating them from further consideration. The 30 remaining sitewide COCs account for over 99 percent of the combined risk to a site receptor model, and they comprise the list from which all of the remediation ASCOCs are drawn. When planning certification for a remediation area, additional selection criteria are used to derive a subset of these 30 COCs. This subset of COCs is passed along to the certification process.

3.1 SELECTION CRITERIA

All of the sitewide primary COCs (total uranium, radium-226, radium-228, thorium-232, and thorium-228) will be retained as ASCOCs for certification in all areas of the site as well as off-property. The selection process for retaining secondary ASCOCs for a remediation area is driven by applying a set of decision criteria. A soil contaminant will be retained as an ASCOC if:

- It was retained as an ASCOC in adjacent FCP soil remediation areas;
- It is listed as a soil COC in the OU5 ROD, and it is listed as an ASCOC in Table 2-7 of the SEP for the Remediation Area of interest (Note: Table 2-7 does not include off-property Area 9);
- Analytical results show that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated CRDLs;
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment; and
- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation.

3.2 ASCOC SELECTION PROCESS FOR A9PIII

Total uranium, radium-226, radium-228, thorium-228 and thorium-232 are sitewide primary COCs, and will be retained as ASCOCs for the A9PIII CUs. Cesium-137 and technetium-99 will be retained because of historical FRL exceedances. The remaining suite of ASCOCs to be analyzed during certification of the A9PIII – Part Three is based on the list of ASCOCs from the adjacent FCP soil remediation area as well as those constituents identified on the 1988 NPDES Permit Application that either have a FRL or are Resource Conservation and Recovery Act (RCRA) characteristic and were detected in the abandoned outfall line. The ASCOCs will be certified to the more stringent off-property soil FRLs identified in the OU5 ROD. The selected A9PIII ASCOCs for the CUs east of A1PII are listed on Table 3-1, along with their applicable FRLs.

Table 3-1 lists the ASCOCs that will be retained for sampling based on the above-listed criteria. The reason for constituent retention is included in the table.

TABLE 3-1
ASCOC LIST FOR A9PIII – PART THREE CERTIFICATION UNITS EAST OF A1PII

ASCOC	Off-Property FRL	Reason Retained
Total Uranium	50 mg/kg	Retained as a primary ASCOC Sitewide
Radium-226	1.5 pCi/g	Retained as a primary ASCOC Sitewide
Radium-228	1.4 pCi/g	Retained as a primary ASCOC Sitewide
Thorium-228	1.5 pCi/g	Retained as a primary ASCOC Sitewide
Thorium-232	1.4 pCi/g	Retained as a primary ASCOC Sitewide
Cesium-137	0.82 pCi/g	Above-FRL concentration
Technetium-99	1.0 pCi/g	Above-FRL concentration
Antimony	0.61 mg/kg	ASCOC for A1PII*
Arsenic	9.6 mg/kg	ASCOC for A1PII
Beryllium	0.62 mg/kg	ASCOC for A1PII
Cadmium	0.91 mg/kg	On NPDES Permit Application and detected
Copper	20 mg/kg	On NPDES Permit Application and detected
Fluoride	850 mg/kg	On NPDES Permit Application and detected
Hexavalent Chromium	11 mg/kg (0.05 mg/kg)	On NPDES Permit Application and detected
Lead	400 mg/kg (200 mg/kg)	ASCOC for A1PII*
Manganese	1400 mg/kg	On NPDES Permit Application and detected
Molybdenum	13 mg/kg (10 mg/kg)	ASCOC for A1PII*
Nickel	34 mg/kg	On NPDES Permit Application and detected
Silver	1.0 mg/kg	On NPDES Permit Application and detected
Zinc	82 mg/kg	On NPDES Permit Application and detected
1,1-dichloroethene	0.059 mg/kg	On NPDES Permit Application and detected
Aroclor-1254	0.04 mg/kg	ASCOC for A1PII
Aroclor-1260	0.04 mg/kg	ASCOC for A1PII
Carbon Tetrachloride	0.091 mg/kg	On NPDES Permit Application and detected
1,1,1-trichloroethane ²	0.19 mg/kg	On NPDES Permit Application and detected
Tetrachloroethene	1.0 mg/kg	ASCOC for A1PII On NPDES Permit Application and detected

* Ecological COC

A1PII – Area 1, Phase II

mg/kg – milligrams per kilogram

pCi/g – picoCuries per gram

¹FRL is actually for 1,1,2-trichloroethane since 1,1,1-trichloroethane does not have a FRL.

4.0 CERTIFICATION APPROACH

4.1 CERTIFICATION DESIGN

The certification design for the A9PIII - Part Three trench CUs follows the same approach described in the CDL for A9PIII - Part One. The points were laid out in the trench that overlay the eastern section of the abandoned outfall line. In order to achieve a whole number of trench CUs in A9PIII - Part Three, the distance between sampling locations had to be reduced to approximately 47 feet, which enabled the placement of CUs 7 and 8. This will allow for more concentrated sampling and ensure the excavation activities had no effect on the soil in A9PIII.

The certification design for CU 9 covers an impacted area in the proximity of MH 181A. Above-FRL sample results for technetium-99 were detected within the area during predesign sampling. This area is horizontally and vertically bound by predesign samples, and will be excavated to remove the impacted soil. The area is bound to the north by boring locations A9P3-MH181-2N4, to the south by A9P3-MH181-2S2, to the west by A9P3-MH181-2W4, and to the east by boring location A9P3-MH181-2E3. The southwestern quadrant of this area will be excavated to 5 feet deep and is bound by boring locations A9P3-MH181-2N2, A9P3-MH181-2S2, A9P3-MH181-2W4, and A9P3-MH181-2E2. The remaining portion of the area will be excavated to 2 feet deep. Certification samples will be collected in the floor and sidewalls of the area following excavation. CU 9 must pass certification before the abandoned outfall line excavation can continue through the area. The CUs are shown on Figure 4-1.

The section of the abandoned outfall line that runs beneath SR 128 is surrounded and protected by a 26-inch protective sleeve. In order to safely excavate near the ends of the protective sleeve, it will be necessary to jack a larger diameter pipe (54-inch) around the 26-inch protective sleeve. The outer protective pipe will, at a minimum, extend the entire length of the protective sleeve. Once the outer 54-inch protective pipe has been put in place, the abandoned outfall line will be forced out of the 26-inch protective sleeve. After the abandoned outfall line has been removed, radiological controls personnel will monitor the exposed interior surfaces of the 26-inch protective sleeve for fixed (direct frisk) and removable (collect smears) contamination as discussed in A9PIII Abandoned Outfall Line Part Three Excavation Plan. This information along with the real-time scans and/or physical sample results from the areas outside of both ends of the sleeve will be utilized in the free release determination. If the interior of the protective sleeve that has been radiologically surveyed passes the radiological free release criteria as described in the guiding documents and regulations, which provide the basis of such justifications (i.e., DOE Order 5400.5, Radiation Protection of the Public and the Environment; 10 Code of Federal Regulations 835; and FCP Site Procedure RP-0025, Radiological

Release of Items and Materials), then the remaining 26-inch protective sleeve will be considered free releasable. Justifications to leave it in place will then be presented in the Certification Report. If the results of the radiological survey reveal the 26-inch protective sleeve cannot pass the free release criteria, then the 26-inch protective sleeve will also be removed. If the 26-inch protective sleeve has to be removed, then soil samples will be collected from the soil that exists between the 26-inch protective sleeve and the outer 54-inch protective pipe at representative spacing as it is removed from within the pipe. A more detailed description of the removal of the protective sleeve can be found in A9PIII Abandoned Outfall Line Excavation Plan, Part III. This activity is described in Project Specific Plan (PSP) for Certification Sampling of A9PIII Abandoned Outfall Line – Part Three (DOE 2005b). If it is necessary to perform this activity, all actions will be documented in a significant variance to the PSP for Certification Sampling of A9PIII Abandoned Outfall Line – Part Three and submitted for agency review and approval.

Sample locations were then evenly spaced across the length of the CUs 7 and 8 with one location falling within each of the 16 sub-CUs. The certification design for CU 9 follows the general approach outlined in Section 3.4 of the SEP. However, biased samples were placed on the shear walls of the excavation. Sample locations with the exception of biased samples were tested against the minimum distance criteria for each CU. All sub-CUs and planned A9PIII certification sampling locations are shown on Figures 4-2 through 4-4. Every fourth sample location in each CU is designated with a "V," indicating archive sample locations. One sample location in each CU is designated with a "D," indicating a field duplicate sample collection location.

Certification sampling locations will be surveyed in the field, offset and flagged on the northern excavation fence for CUs 7 and 8. If there is evidence of leakage from the outfall line (e.g., broken, cracked, or disjointed piping), then a biased sample location will be flagged on the fence line, and samples will be collected from the floor and both the north and south sidewalls approximately one foot from the floor of the excavation. Locations may be moved if a subsurface obstacle such as a rock or tree root prevent collection. Requirements for moving a certification sample location will be discussed in the PSP for Certification Sampling of A9PIII Abandoned Outfall Line – Part Three.

All sampling locations in each of the trench CUs will be collected from the bottom of the excavation from the bucket of an excavator after the piping, bedding material, and roughly 6 inches of underlying soil have been removed. The goal will be to collect the top 6 inches of soil from the bottom of the excavation. The four samples designated as "archive" will be collected and stored in the event they are needed for additional analysis.

4.2 ANALYTICAL METHODOLOGY

Laboratory analysis of certification samples will be conducted using an approved analytical method, as discussed in Appendix H of the SEP. The minimum detection level (MDL) will be set at 10 percent of the FRL but the low off-property FRLs may result in difficulties for laboratories to meet 10 percent of the FRL for some analytes. In those instances, the MDL will be set as low as reasonable below the FRL. Analysis will be conducted to Analytical Support Level (ASL) D or E, where the MDL of the FRL is above the Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ) ASL detection level, but the analyses meet all other SCQ ASL D criteria. An ASL D data package will be provided for all of the analytical data. Because results are batched or grouped by CU, all results from a minimum of one of the two CUs will be validated to Validation Support Level (VSL) D. Samples rejected during the validation process will be re-analyzed, or an archive sample may be substituted if there is insufficient material available from the initial sample. Once data are validated as required, results will be entered into the Sitewide Environmental Database (SED).

4.3 STATISTICAL ANALYSIS

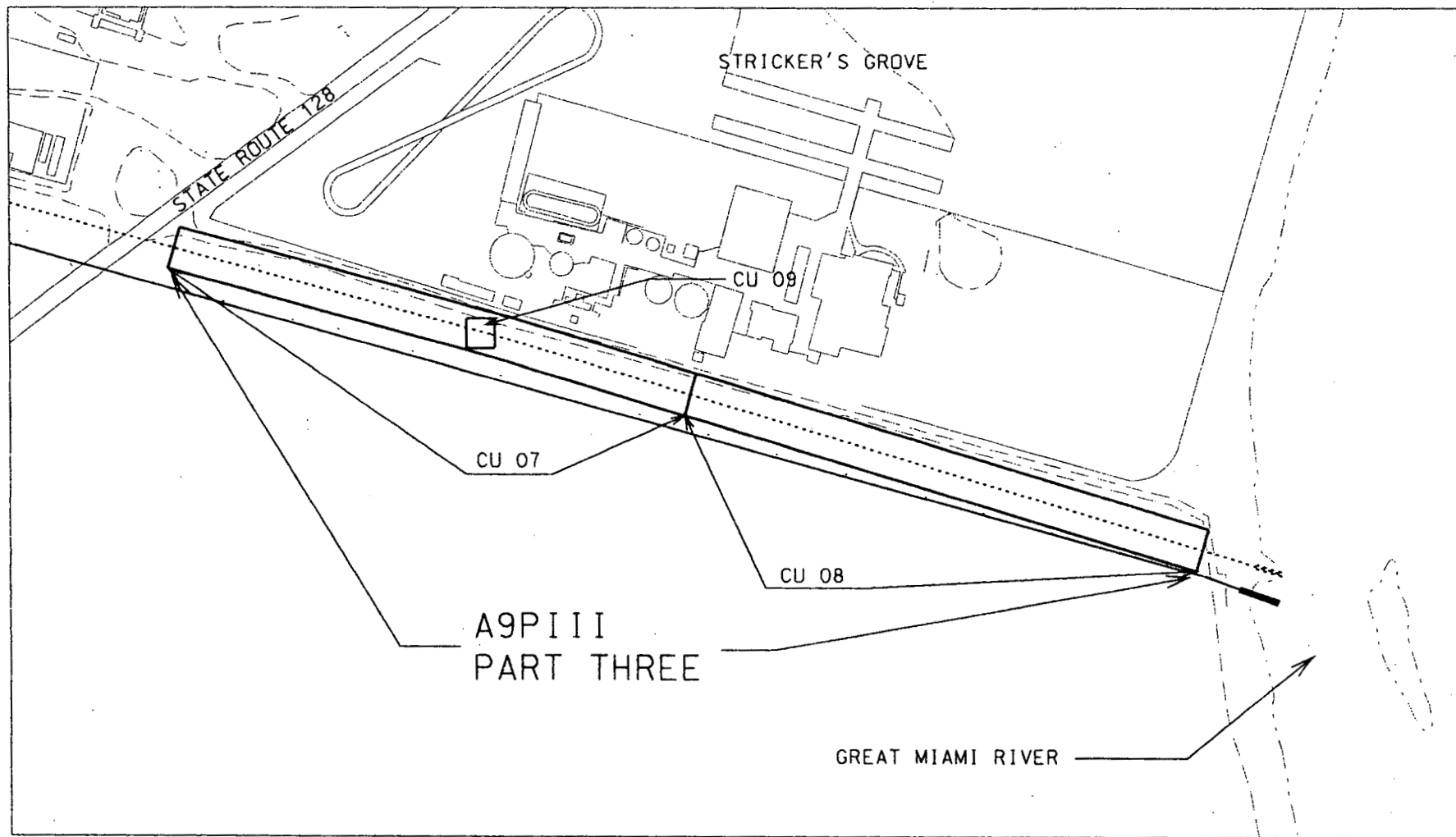
Once data are entered into the SED, a statistical analysis will be performed to evaluate the pass/fail criteria for each CU including any biased samples that are collected within the CU. The statistical approach is discussed in Section 3.4.3, Appendix G of the SEP, and Section 3.4.8 of the SEP Addendum.

When all CUs within the scope of this CDL have passed certification, a Certification Report will be issued. The Certification Report will be submitted to the regulatory agencies to receive acknowledgment that the pertinent operable unit remedial actions were completed, and the individual CUs are certified and may be released for interim or final land use. Section 7.4 of the SEP provides additional details and describes the required content of the Certification Report.

4.3.1 Surface Samples (0 to 6-inch)

Two criteria must be met for the CU to pass certification. If the data distribution is normal or lognormal, the first criterion compares the 95 percent Upper Confidence Limit (UCL) on the mean of each primary COC to its FRL, or the 90 percent UCL on the mean of each secondary ASCOC. On an individual CU basis, any ASCOC with the 95 percent UCL for primary ASCOCs (or 90 percent UCL for secondary COCs) that are above the FRL results in that CU failing certification. If the data distribution is not normal or lognormal, the appropriate nonparametric approach discussed in Appendix G of the SEP will be used to evaluate the second criterion. The second criterion is the hot spot criterion, which states that primary or secondary ASCOC results must not exceed two times the FRL. When the given UCL on the mean for each COC is less than its FRL and the hot spot criterion is met, the CU will be considered certified.

In the event that a CU fails certification, the following scenarios will be evaluated: 1) a high variability in the data set, 2) localized contamination, and 3) widespread contamination. Details on the evaluation and responses to these possible outcomes are provided in Section 3.4.5 of the SEP.



LEGEND:

- ABANDONED 16" OUTFALL LINE
- EXISTING 24" OUTFALL LINE

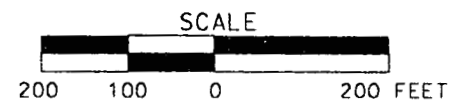
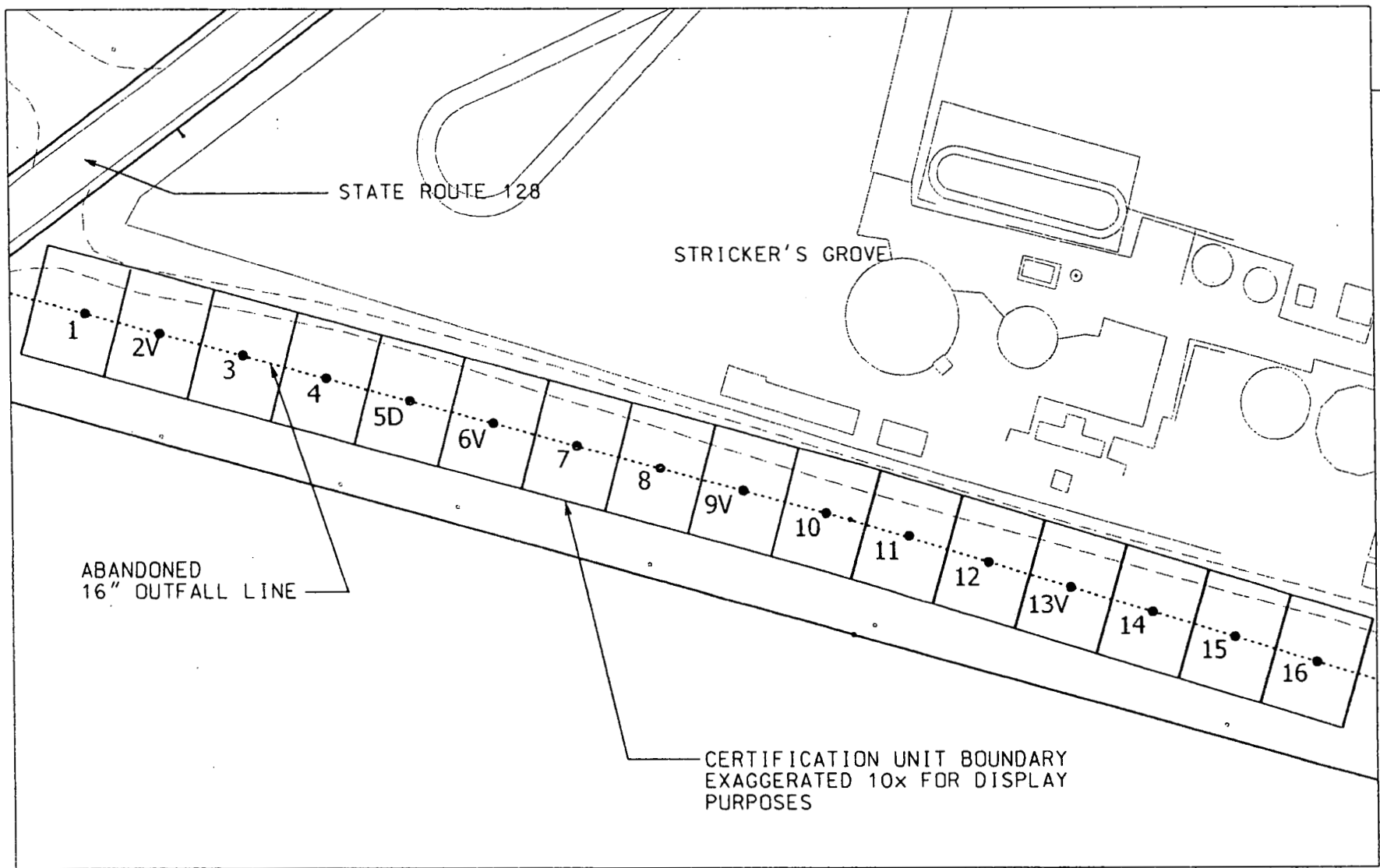


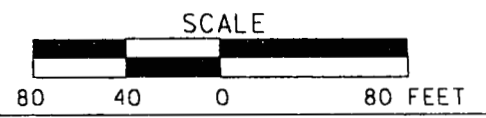
FIGURE 4-1. AREA 9 PHASE III, PART THREE CU LOCATIONS

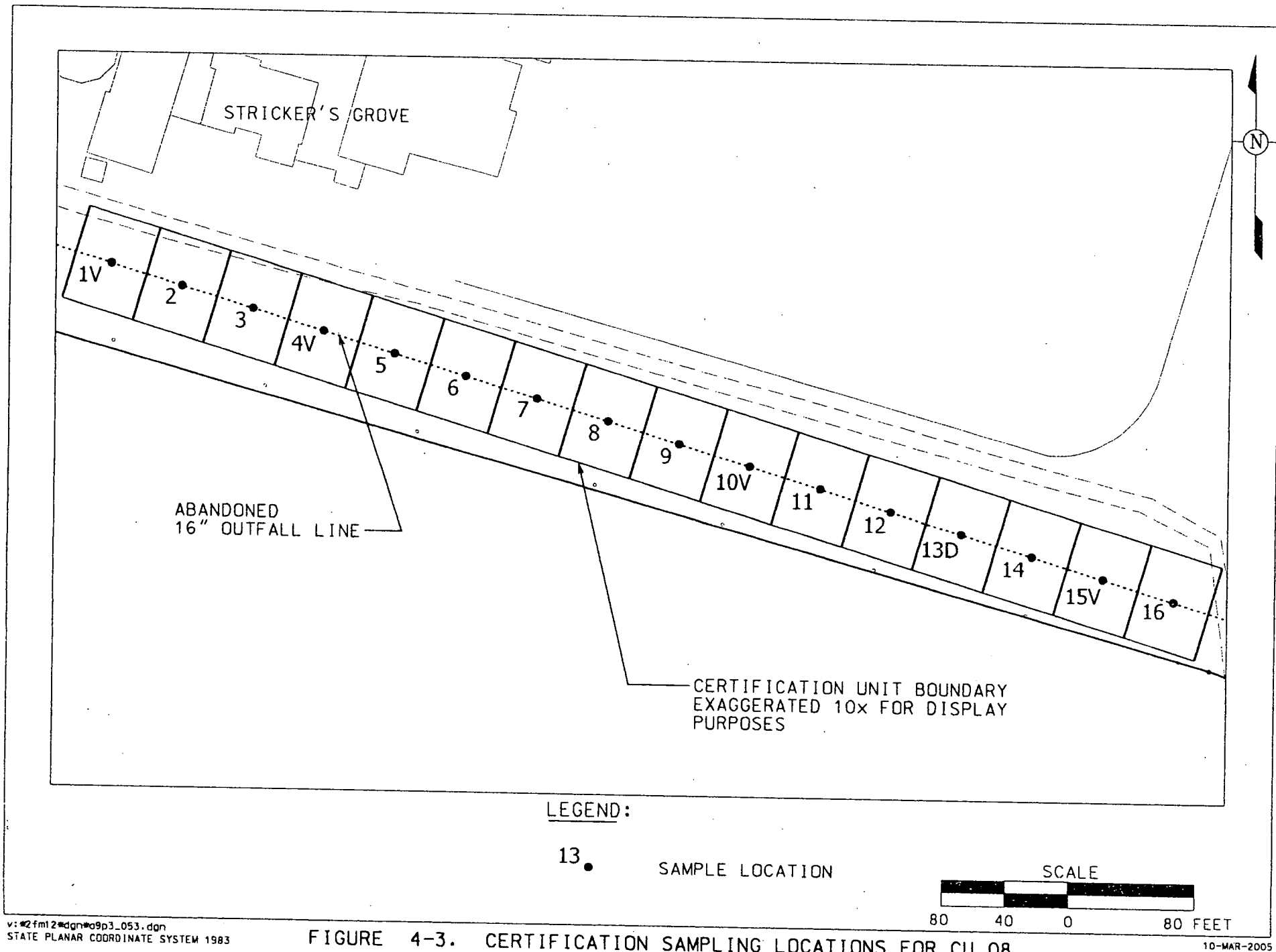
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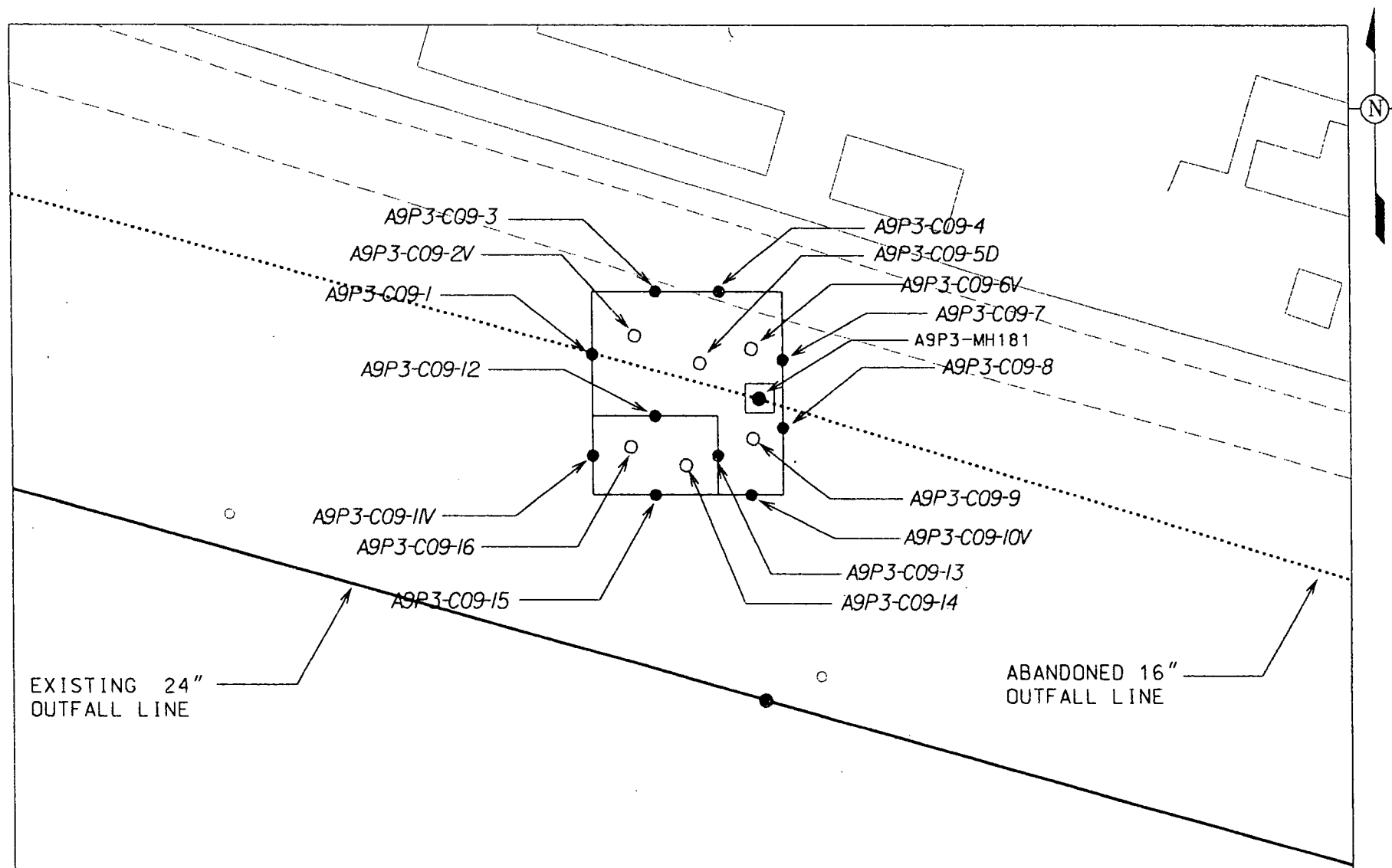
LEGEND:

13 • SAMPLE LOCATION



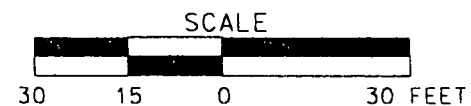


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LEGEND:

- SIDEWALL SAMPLE LOCATION
- FLOOR SAMPLE LOCATION



5.0 SCHEDULE

The following draft schedule shows key activities for the completion of the work within the scope of this CDL. Implementation of this schedule is pending funding availability and property access. If necessary, an extension will be requested.

<u>Activity</u>	<u>Target Date</u>
Submittal of Certification Design Letter	November 9, 2004
Start of Certification Sampling	November 9, 2004
Complete Field Work	April 19, 2005
Complete Analytical Work	May 20, 2005
Complete Data Validation and Statistical Analysis	May 26, 2005
Submit Certification Report	June 1, 2005 ^a

^a Only the date for submittal of the Certification Report is a commitment to the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency. Other dates are internal target completion dates.

FCP-A9P3AOL-PT3-CDL-FINAL
21140-RP-0004, Revision 0
March 2005

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